

### Efficient control of multi-well pads for the entire production lifecycle

IntelligentCore Suite

INTELLIGENT ACTION

### **Bring Intelligent Action and** industrial-level efficiency to your multi-well pads

#### **Control system changes and modernization** throughout the well lifecycle can be both a time consuming and costly process to design and test.

Meaning many operators are looking at the bigger picture to prioritize flexible, scalable and reusable solutions that enable them to design once and build many.

Our IntelligentCore suite of production applications have been engineered to bring you unparalleled control over multiple wells, lifecycles and production analysis - which can be implemented throughout all of your assets.

A true end-to-end digital multi-well pad production automation solution, the IntelligentCore suite can control multiple gas lift and plunger lift wells as the lifecycle demands. Flexible, seamless to integrate and easy to reconfigure - the IntelligentCore suite has been designed to scale right alongside your ambitions.



# Take the next step on your automation journey

#### A Sensia first, powered by Rockwell Automation

Sensia was born from bringing together the best of the best. Unifying the deep oil & gas domain knowledge of SLB and the automation excellence of Rockwell Automation to create game-changing oil & gas innovations.

IntelligentCore has been built on the Rockwell Automation field-proven and industry-leading ControlLogix PLC and HMI architecture to bring you best-in-class industrial automation.

#### Benefits

- + Enjoy effortless edge control
- + Increase throughput and uptime
- + Reduce total cost of ownership
- + Make edits while online
- + Expand and scale your way



### **Pre-engineered** applications for seamless integration

Our IntelligentCore suite brings you a set of pre-engineered, pre-written pre-tested applications that allow you to get to first production faster.

Thanks to our flexible to deploy pre-programmed applications, Sensia can help you architect a system that is fit to scale to your requirements now, while allowing for growth over time. Choose only the applications that you need at the moment and add more later as new wells and equipment are added over time.

Powering your multi-well production with one controller and program file that includes all process control logic and IntelligentCore Activations.

#### Explore the potential of our four pre-programmed applications

- + Cause & Effect Charts Excel based configuration tool that can configure up to 25 charts with 30 inputs x 16 outputs.
- + Automatic Well Testing configurable well test sequences to schedule multiple wells to test through a separator.
- + Gas Lift automatic unloading and flow injection control with tubing and casing alarm overrides of the flow injection valve.
- + Plunger Lift intermitter and plunger control with multiple settings for open and close criteria of the sales valve and optimization of plunger cycles.

**SAVE UP TO** 30%

on the engineering labor of designing, building and testing of a control system with our preprogrammed applications.



#### **Typical Architecture**





### **Cause & Effect charts**

#### Get the full operational picture.

Communicate directly from our Excel based tool to upload and download runtime configuration. Perform backup operation, and compare online v.s. offline configurations with built in chart comparison tools.

Utilize pre-built HMI template to view first out notifications and identify which instrument on what equipment caused a shutdown.

- + Provides accurate documentation of runtime C&E logic
- + Excel configuration tool writes configuration directly to PLC
- + 25 logic charts with 30 causes & 16 effects each
- + I/O descriptions, alarm set points and tag usage documentation
- + Dozens of useful configuration tools built into the configuration tool: Copy, Paste, logic validation, upload, download, compare
- + HMI display is read only no configuration available
- + HMI displays chart logic, I/O information
- + Easily determine First Out shutdowns

225 LOGIC CHARTS of 300 INPUTS by 16

**OUTPUTS** 

### **Offline Configuration Tool**



#### **Runtime Monitoring**

### **Automatic well testing**

#### Gain well production knowledge.

Seamlessly control well test schedule, configure test timing and capture test report data for up to 16 wells.

#### **Operation Modes**

- + Single well test
- + Automatic test sequence

#### Well Test Control

- + Purge time, test time, well testing sequence
- + Enable or disable well on sequence
- + Start Test, Hold Test, Abort Test
- + Test well out of sequence
- + Customizable well test auto accept criteria

#### **Test Header Sequencing**

- + Control well test actuators to ensure the correct well is flowing through the separator
- + Control Mulit-selector valve, or individual valves
- + Up to 16 wells per test separator
- + Up to 4 well test separators per controller
- + Last 5 well tests from each well stored in the controller





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Example Operation Display the current test data.

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### View the status of well test for all wells and

#### Example Report Display View the last 5 well tests of each well.

## Gas lift

## Enable autonomous unloading, injection and analysis of up to 16 gas lift wells in a single controller.

Control your gas lift injection valve and perform automatic unloading of your gas lift well based on API Gas Lift Handbook recommendations.

#### Autonomously unload a well

- + Using API Handbook recommended practice
- + Detect U-Tube through top valve
- + Detect maximum depth and switch to continuous injection control

#### Control gas lift injection at desired setpoint

- + Maintain injection flow setpoint
- + Override flow injection when Injection Pressure or Production Pressure exceed safe limits

#### Monitor and report injection flow total

- + Injection Pressure & Production Pressure
- + Annulus valve information

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#### Startup mode screen

Choose how to unload a well, they can choose either static flow injection or pressure ramp control.

**Gas Lift main display** Start and stop the injection to the well. Tubing and casing

override control can also be configured.



#### Autonomous unloading procedure

The Gas Lift application unloads liquid from the injection space to ensure annulus valves are not damaged – ramping injection rate as it detects valves being uncovered.



save up to 8hrs

when starting up a loaded well, the IntelligentCore algorithm autonomously unloads liquid out of the injection space by following the API recommended practice.

# **Plunger lift**

### **Optimize based on plunger cycles - with** up to 16 plunger lift wells per controller.

Control intermitter and standard plunger wells with customizable open and close criteria and optimization based on plunger arrival times.

#### Well Types

+ Intermitter, Intermitter with Criteria, Plunger

#### **Well Operation**

+ Stop, Automatic, Force Open, Force Close

#### Sales Valve Operation

- + 7 open criteria + 1 custom criteria
- + 6 close criteria + 1 custom criteria
- + Select 1 open/close criteria for cycle optimization
- + Selectable fallback criteria

#### Reporting

- + Cycle logs (56), Daily logs (9), Monthly (2), Plunger Arrival Statistics
- + Historical trend display on HMI





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Main Well Operation Display Start and stop wells and view the state of the open and close criteria, in addition to seeing live data from the well.

### Well Configuration Display configuration.



### PLUNGER LIFT WELLS PER CONTROLLER

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Set the well depth, tubing, casing and plunger information in addition to plunger characteristic



#### Criteria Display

Choose when valves open by configuring open and close criteria. One criteria can be selected for optimization when operating in plunger mode.



### Solving challenges from the reservoir to refinery. One challenge at a time.

We collaborate with all stakeholders to make the production, transportation and processing of oil & gas simpler, safer, more secure, more productive and better understood from end-to-end. Sensia is making the advantages of industrial-scale digitalization and seamless automation available to every oil & gas company.

Now every asset can operate more productively and more profitably.

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